

IN THE SPECIFICATION:

Please replace paragraph [0001] with the following amended paragraph.

--[0001]

This invention relates to an image forming apparatus such as, e.g., electrophotographic copier, and electrophotographic printer, to a process cartridge detachably attached to the image forming apparatus body, and to an electric contact ~~point~~ member suitable to be used in those apparatuses.--

Please replace paragraph [0011] with the following amended paragraph.

--[0011]

It is an object of the invention to provide an electric contact ~~point~~ member stably applying voltage to a charger moving reciprocally, a process cartridge, and an image forming apparatus.

It is another object of the invention to provide an electric contact ~~point~~ member, a process cartridge, and an image forming apparatus, not suffering from charging defects or image defects. ~~defects~~,

It is yet another object of the invention to provide an electric contact ~~point~~ member, a process cartridge, and an image forming apparatus so that a charger can feed a proper charge amount to the remaining developing agent on an image carrier.

It is still another object of the invention to provide an electric contact ~~point~~ member, a process cartridge, and an image forming apparatus preventing developing agent collection defect from occurring out of an image carrier or preventing the charging means from

getting dirty upon attachments of the developing agent, caused by an improper charge amount of the remaining developing agent on the image carrier.

It is still further object of the invention to provide a process cartridge and an image forming apparatus utilizing an advantage from a non-cleaner system.--

Please replace paragraph [0012] with the following amended paragraph.

--[0012]

Fig. 1 is an illustration showing the whole structure of a laser beam printer as an embodiment of a multicolor electrophotographic image forming apparatus;

Fig. 2 is a cross section showing a process cartridge and a developing agent supplying container;

Fig. 3 is an appearance perspective view showing an image forming apparatus;

Fig. 4 is a cross section along a longitudinal direction showing a process cartridge;

Fig. 5 is a cross section along a longitudinal direction showing a developing agent supplying container;

Fig. 6 is a diagram along a longitudinal direction showing a charging unit;

Fig. 7 is a cross section showing the charging unit adapting a non-cleaner system;

Fig. 8 is a perspective view showing the charging unit adapting the non-cleaner system;

Fig. 9 is a perspective view showing a feeding contact ~~point~~ member and the vicinity of the charging unit; and

Fig. 10 is a perspective view showing a feeding metal plate for ~~brush~~ brush feeding and a ~~brush~~ brush feeding contact ~~point~~-member.--

Please replace paragraph [0013]with the following amended paragraph.

--Now, embodiments of an electric contact ~~point~~ member, a process cartridge, and an image forming apparatus, according to the invention are described. In the description below, the term "longitudinal direction" is a direction perpendicular to the conveyance direction of the recording medium and is the same direction to the axial direction of the image carrier. The term "right and left" is the right and left direction when seen from the conveyance direction of the recording medium. The term "up and down" is the up and down direction when the cartridge is mounted.--

Please replace paragraph [0028]with the following amended paragraph.

--[0028]

[Non-Cleaner System]

The image forming apparatus in this embodiment adapts a non-cleaner system. This non-cleaner system is described. Fig. 7 is a cross section showing the charging unit adapting a non-cleaner system; Fig. 8 is a perspective view showing the charging unit

adapting the non-cleaner system; Fig. 9 is a perspective view showing a feeding contact point member and the vicinity of the charging unit.--

Please replace paragraph [0033] with the following amended paragraph.

--[0033]

In this embodiment, a remaining developing agent charging amount controlling means serving as a charger to which a negative voltage applies, e.g., a ~~brush~~ brush member (hereinafter referred to as "charging controlling ~~brush~~ brush 3h") is arranged on an upstream side in the rotation direction of the photosensitive drum 2 with respect to the charging roller 3a and on a downstream side with respect to the transfer portion d to render the charging polarity of the remaining developing agent image uniformly at the negative polarity as the normal charging polarity of the developing agent. Furthermore, a remaining developing agent image unifying ~~means~~, ~~mean~~, e.g., a ~~brush~~ brush member (hereinafter referred to as "unifying ~~brush~~ brush 3g") is arranged on an upstream side in the rotation direction with respect to the charging controlling ~~brush~~ brush 3h and on a downstream side with respect to the transfer portion d to unify the remaining developing agent image on the photosensitive drum 2. A positive voltage applies to the remaining developing agent image unifying ~~means~~ ~~mean~~.--

Please replace paragraph [0035] with the following amended paragraph.

--[0035]

In this embodiment, the unifying ~~brush~~ brush 3g and the charging controlling ~~brush~~ brush 3h are ~~brush~~ brush shaped members having a proper conductivity, and are disposed so that the ~~brush~~ brush portion is in contact with the surface of the photosensitive drum. Those means move (or reciprocally move) in the longitudinal direction of the photosensitive drum by a drive source, not shown.--

Please replace paragraph [0037] with the following amended paragraph.

--[0037]

As shown in Fig. 8, a ~~brush~~ brush unit 3j is constituted by securing the unifying ~~brush~~ brush 3g and the charging controlling ~~brush~~ brush 3h to a ~~brush~~ brush supporting member 12. As shown in Fig. 9, the ~~brush~~ brush unit 3j is supported to a ~~brush~~ brush unit supporting portion 3k2 so as to be movable reciprocally with respect to the longitudinal direction of the photosensitive drum 2.--

Please replace paragraph [0038] with the following amended paragraph.

--[0038]

The reciprocal movement of the ~~brush~~ brush unit 3j is substantially the same as the charging roller cleaning unit 3f, and the rotational drive is transmitted from a body coupler, not shown, to a coupling 15 formed at the developing apparatus and further transmitted

from a coupling gear portion 15 integrally formed to the coupling 15 via the cam gear 16a to the cam portion 16b. The cam portion 16b is arranged so that a reciprocal movement transmission arm 14 secured to an end of the ~~brush~~ brush supporting member 12 is located at the cam portion 16b, and by engaging the cam portion 16a with a protrusion 14a of the transmission arm 14 ~~arm 14~~, the rotational drive at the cam portion 16 is converted to reciprocal movement, thereby moving reciprocally the ~~brush~~ brush unit 3j in the longitudinal direction of the charging roller 3a. In this embodiment, the unit moves reciprocally with 5 mm stroke and a constant period in a range of about 0.5 to 2.5 seconds. It is to be noted that as shown in Fig. 6, the cam portion 16 may be urged by using a returning spring 31, but as shown in Fig. 8, a protrusion 14 may be made to slide where a groove or grooves are formed at the cam portion 16.--

Please replace paragraph [0039] with the following amended paragraph.

--[0039]

By providing the movable mechanism as described above, the unifying ~~brush~~ brush 3g and the charging controlling ~~brush~~ brush 3h do not stably take a single position on the photosensitive drum, and therefore, even where overcharging portions or charging shortly portions exist due to resistance irregularity of the charging controlling ~~brush~~ brush 3h, the mechanism prevents the remaining developing agent image from melting and adhering to the surface of the photosensitive drum due to local overcharge of the remaining developing agent image and prevents the remaining developing agent image from clinging to the charging roller 3a due to shortage of charges or reduces such occurrences.--

Please replace paragraph [0043] with the following amended paragraph.

--[0043]

[Developing Means]

The developing apparatus 4 as the developing means is a two component contact developing apparatus (two-component magnetic ~~brush~~ brush developing apparatus) as shown in Fig. 2, and holds a carrier and a developing agent on a developing sleeve 4a as a developing agent carrier containing a magnet roller 4b. A limiting blade 4c is formed to the developing sleeve 4a with a prescribed gap, and according to the rotation of the developing sleeve 4a in the arrow direction, a developing agent of a thin layer is formed on the developing sleeve 4a.--

Please replace paragraph [0047] with the following amended paragraph.

--[0047]

The developing step in which the electrostatic latent image formed on the photosensitive drum 2 is visualized using the developing apparatus 4 in the two-component magnetic ~~brush~~ brush method and a circulation system of the developing agent are described. According to the rotation of the developing sleeve 4a, the developing agent in the developing apparatus is conveyed upon sucked up to the surface of the developing sleeve 4a at a sucking up pole of the magnet roller 4b. During the midway of the conveyance, the developing agent is subject to a limitation on the thickness by a limiting blade 4c disposed perpendicularly to the developing sleeve 4a, thereby forming a thin layer developing agent on the developing sleeve 4a. When the thin layer

developing agent is conveyed to the developing pole corresponding to the developing portion, standing upright phenomenon like ears is formed by magnetic force. The electrophotographic latent image on a surface of the photosensitive drum 2 is developed as a developing agent image with the developing agent in the developing agent thus formed standing upright in an ear shape. In this embodiment, the electrophotographic latent image is reverse developed.--

Please replace paragraph [0068] with the following amended paragraph.

--[0068]

[Electric Contact ~~Point~~ Member]

Next, an electrically feeding contact member as an electric contact ~~point~~ member in the charging unit having the above structure is described using Fig. 7, Fig. 8, Fig. 9, and Fig. 10. Fig. 10 is a perspective view showing a feeding metal plate for ~~brush~~ brush feeding and a ~~brush~~ brush feeding contact ~~point~~ member.--

Please replace paragraph [0069] with the following amended paragraph.

--[0069]

As shown in Fig. 7, Fig. 8, as described above, the unifying ~~brush~~ brush 3g as an example of the remaining developing agent image unifying means as a charger, and the charging amount controlling ~~brush~~ brush 3h as an example of the remaining developing agent image charging amount controlling means as a



charger are secured to the ~~brush~~ brush supporting member 12 in the charging unit 3 constituting a part of the process cartridge 1, and are disposed reciprocally movable as the ~~brush~~ brush unit 3j. The function of the non-cleaner system can be done by feeding stably from the apparatus body to the unifying ~~brush~~ brush 3g and the charging controlling ~~brush~~ brush 3h of the ~~brush~~ brush unit 3j reciprocally movable.--

Please replace paragraph [0070] with the following amended paragraph.

-- [0070]

As shown in Fig. 7, Fig. 9, feeding is made to the unifying ~~brush~~ brush 3g ~~form~~ from the apparatus body via a first feeding plate 20, and a first feeding contact ~~point~~ member 22 as a first electrically contact ~~point~~ member. In substantially the same way, feeding is made to the charging controlling ~~brush~~ brush 3h via a second feeding plate 21, and a second feeding contact point member 23 as a second electrically contact point member. The first feeding plate 20 secured to the charging container 3k is fed by the power source as a voltage applying means formed at the apparatus body, and is connected to the first feeding contact ~~point~~ member 22 at a contact point portion 20a (see, Fig. 9). The first feeding contact point member 22 is connected to a contact point portion 3g10 (see, Fig. 7), and feeding is made from the back surface of a metal plate base 3g1 to the unifying ~~brush~~ brush 3g. In substantially the same way, the second feeding plate 21 secured to the charging container 3k is fed by the power source of the apparatus body, and is connected to the second feeding contact ~~point~~ member 23 at a contact ~~point~~ portion 21a (see, Fig. 9). The second feeding contact ~~point~~ member 23 is connected to a contact ~~point~~

portion 3h10 (see, Fig. 7), and feeding is made from the back surface of a metal plate base 3h1 to the charging controlling ~~brush~~ brush 3h.--

Please replace paragraph [0071] with the following amended paragraph.

--[0071]

Fig. 10 illustrates only the first feeding plate 20, the second feeding plate 21, the first feeding contact ~~point~~ member 22 extending linearly, and the second feeding contact ~~point~~ member 23 extending linearly. The first and second feeding contact ~~point~~ members 22, 23 are in a linear shape, and therefore, it is advantageous because no large load is exerted mechanically when a voltage is supplied to the ~~brushes~~ brushes 3g, 3h. Although a positive voltage is applied to the first feeding contact ~~point~~ member 22 whereas a negative voltage is applied to the second feeding contact ~~point~~ member 23, the distance between the first feeding contact ~~point~~ member 22 and the second feeding contact ~~point~~ member 23 in the left and right direction in Fig. 7 (or a direction perpendicular to the longitudinal direction of the photosensitive drum) can be maintained at a distance not electrically leaking between the members because the members are in the linear shape, so that a further compact space is possible.

As shown in Fig. 10, the opposite ends of the first feeding contact ~~point~~ member 22 are formed at a torsion spring 22a as a fixing portion and a coil spring 22b as a portion moving reciprocally. In substantially the same way, the opposite ends of the second feeding contact ~~point~~ member 23 are formed at a torsion spring 23a as a fixing portion and a coil spring 23b as a portion moving reciprocally. With this structure, the feeding contact

~~point~~ members 22, 23 can be transformed according to the ~~brush~~ brush unit 3j reciprocally moving, so that feeding can be made always.--

Please replace paragraph [0072] with the following amended paragraph.

--[0072]

However, where the ~~brush~~ brush unit 3j ~~move~~ moves reciprocally, the feeding contact ~~point~~ members 22, 23 receive the load repeatedly. Particularly, because the distance between the opposite ends of the feeding contact ~~point~~ members 22, 23 may vary in association with the reciprocal movement of the ~~brush~~ brush unit 3j, the torsion spring and the coil spring may not correspond to the change in terms of the mechanism, so that the load exerted to the members may become so large. Where the members are used for a long period of time, the feeding contact ~~point~~ members 22, 23 may be broken or dropped, and charging defects or collection defects may occur due to feeding shortage to the unifying ~~brush~~ brush 3g and the charging controlling ~~brush~~ brush 3h.--

Please replace paragraph [0073] with the following amended paragraph.

-- [0073]

To recoup this problem, as shown in Fig. 10, in this embodiment, a ring shaped elastic torsion spring 24 as a buffer portion as an example of a buffering mechanism is formed between the torsion spring 22a at the securing portion on the power source side and the coil spring 22b at the moving portion on the charger side in the first feeding contact ~~point~~ member 22. In the second feeding contact ~~point~~ member 23, a ring shaped elastic

torsion spring 25 as a buffer portion as an example of a buffering mechanism is formed between the torsion spring 23a at the securing portion on the power source side and the coil spring 23b at the moving portion on the charger side.--

Please replace paragraph [0074] with the following amended paragraph.

--[0074]

It is to be noted that the buffering mechanism is not limited to the torsion spring and the coil spring, a member having an elastic shape with elasticity to the distance between the opposite ends of the feeding contact ~~point~~ members 22, 23 may be used. Accordingly, for example, a bending portion in a mountain shape, a wave shape, and a saw shape may be formed at an intermediate portion of the feeding contact ~~point~~ members 22, 23, or a large curving between the opposite ends may take advantages of the invention though with a simpler structure.--

Please replace paragraph [0075] with the following amended paragraph.

--[0075]

As described above, the electric contact ~~point~~ member, the process cartridge, and the image forming apparatus according to the invention can buffer repetitive loads exerted to the electric contact ~~point~~ member with a very simple structure but without inviting increase of the part number, thereby preventing the electric contact ~~point~~ member from receiving damages or dropping off. Therefore, surely feeding can be made to the remaining developing agent charging amount controlling means and the remaining developing agent

image unifying means, so that charging defects or collection defects of the remaining developing agent can be prevented.--